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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Samuel Marlin

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EXAMINER

WIESE, NOAH S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/553,438	Applicant(s) MARLIN, SAMUEL	
	Examiner NOAH S. WIESE	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 8-25 is/are pending in the application.
- 4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-12 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Status of Application

1. Acknowledgement is made of amendments filed on 02/25/2008. Upon entering the amendments, the claims 23-25 are added.
2. The claims 1-5, 8-12, and 23-25 are pending and presented for the examination.

Rejections Withdrawn

3. Claim 1 has been amended to overcome the 112 rejection set forth in the previous office action. Therefore, the rejections of the claim and of the dependent claims 2-5 and 8-9 have been withdrawn.

Applicant's Arguments

4. Applicant's arguments filed 02/25/2008 have been fully considered but are not persuasive.

Applicant argues that Nikitina does not teach ceramic grains containing less than 200 ppm carbon. The reasoning behind this is that the low carbon content in applicant's ceramic grains is due to the reducing conditions used when fusing the ceramic grains. Applicant argues that because Nikitina does not teach reducing conditions, the fused ceramic grains must have a carbon content over 200 ppm. However, this reasoning is unconvincing. Applicant does not define what is meant by reducing conditions. In the fusing of ceramic grains, the term reducing conditions generally refers to the addition of carbon to the mixture before arc melting. This is done in applicant's method. The amount of carbon added to the mixture determines the amount remaining in the ceramic grains. Applicant teaches that between 0.8 wt% and 5.5 wt% carbon is added to the

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mixture before it is arc melted into ceramic grains. Absent any other disclosure by applicant, it is assumed that this added carbon is the source of carbon in the fused grains, and is also what creates the reducing conditions.

In contrast, Nikitina teaches no addition of carbon to the mixture before arc melting is carried out. This would indicate that no carbon, or at least not an appreciable amount, would be in the fused grains. This amount would certainly be below 200 ppm. Therefore, the contention that Nikitina teaches ceramic grains that meet this limitation is maintained.

Applicant argues that Nikitina teaches that it is advantageous to add one or more oxides from the group MgO, SiO, and CaO. However, this argument misrepresents the teachings of Nikitina. This teaching of Nikitina refers to the deliberate addition of MgO to the alumina to produce fused ceramic grains with the desired, two-component composition. It is not, as applicant contends, an indication of impurities. Further, Nikitina teaches that *one* or more of these oxides can be added, which obviously teaches that only MgO can be added, rendering the composition of Nikitina equivalent to that of applicant. Indeed, Nikitina teaches several examples wherein only MgO (as corundum) is added (see Table 1, examples 6-10 and Table 2, examples 1-6). No other SiO₂ is added. Therefore, it is clear that Nikitina teaches grains containing less than 0.1 wt% SiO₂.

Applicant further argues that Nikitina teaches away from the composition that meets the compositional limitations of claim 1 because this composition shows decreased abrasiveness. However, this argument is not convincing because even if

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Nikitina teaches away from the composition, the composition is still taught and disclosed, and thus the composition of claim 1 is anticipated.

Applicant argues that Nikitina teaches that the surrounding spinel phase would be entirely stoichiometric because the MgO is added based on a stoichiometric ratio. However, even if the MgO is initially added stoichiometrically, given the imprecise nature of fusion processing the resulting composition cannot be precisely predicted. Therefore, it is still the position of the examiner that at least a portion of the spinel layers would contain nonstoichiometric compositions, especially since Nikitina teaches that the amount of MgO added can be varied over a fairly broad range. Because of these reasons, applicant's limitation regarding the nonstoichiometry of the spinel phase does not constitute a contribution over the prior art of record.

For these reasons, the rejections previously issued for the non-amended claims are maintained. These rejections are repeated in the following section.

Previous Art Rejections

5. Claims 1-5, 8-9, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Nikitina et al (US 4906255).

Regarding **claims 1-5 and 8**, Nikitina et al is drawn to an abrasive material comprising corundum crystals surrounded by an additive that can be spinel (see Abstract). An example is taught wherein corundum crystals are surrounded by spinel in the amount of 8-10 wt% spinel (see page 5, Table 1, composition 10). Using the chemical formulas Al_2O_3 for corundum and $\text{MgO} \bullet \text{Al}_2\text{O}_3$ for spinel, this is equivalent to 2.27-2.83 wt% MgO, with the balance being Al_2O_3 . This range of compositions

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anticipates the compositions of claims 1-5. No minimum silica content is taught by Nikitina et al. However, neither is the inclusion of silica or any other component besides alumina and magnesia taught. It was known in the art at the time the invention was filed that keeping silica and other impurities to a minimum is beneficial to abrasives. This is stated by applicant (see Specification, page 4, lines 20-26). Therefore, one of ordinary skill in the art would have known to keep impurities to a minimum, and the lack of explicit impurities limits in Nikitina et al does not preclude anticipation.

The grain size limitation of claim 1 is drawn to an older European standard that is not available to the examiner. However, the FEPA website has been used to obtain what is thought to be an equivalent grit size according to a more current standard. This grit size is P50, from the "FEPA-standard 43-1:2006: Grains of fused aluminum oxide, silicon carbide and other abrasive materials for coated abrasives". The grit size P50 is equivalent to a mean grain size of 336 μm . The grain sizes of the corundum and spinel composition taught by Nikitina et al are given as 240-300 μm (see page 5, Table 1, composition 10). Since this clearly falls below the grit size that is thought to be equivalent to that claimed by applicant, this limitation is anticipated by Nikitina et al.

Regarding **claim 9**, as discussed above, Nikitina et al teaches that that crystals are corundum crystals surrounded by spinel phase. However, Nikitina et al is silent to the stoichiometry or nonstoichiometry of the spinel phase. However, it is the position of the examiner that the spinel in the material taught by Nikitina et al would inherently be at least partially nonstoichiometric, because the stoichiometry or nonstoichiometry of the spinel phase is a function of the processing conditions of the MgO and Al₂O₃ raw

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materials. Nikitina et al teaches substantially the same processing steps as instant application. Therefore, it would be expected that the resulting structure, and thus nonstoichiometry, would be the same. Nikitina et al teaches that the material is produced by arc melting corundum with the addition of MgO (see column 4, lines 28-34). The instant application claims the method of arc melting a composition containing corundum and MgO. These are equivalent processes, and thus the spinel phase produced would be equivalent, in oxide composition and in stoichiometry. Therefore, the further limitation of claim 9 is met, and the claim is anticipated by Nikitina et al.

Regarding **claim 12**, Nikitina et al teaches that the corundum crystals are from 5-350 μm in size (see Abstract). Additionally, the corundum crystal sizes of the material given in Table 1, composition 10 (discussed above) is from 240-300 μm . Both of these teachings indicate that 100% of the crystals would have a size above 5 μm .

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nikitina et al (US 4906255).

Regarding **claim 10**, as discussed above, Nikitina et al teaches an example whose compositions anticipate those of the instant application. The crystal sizes given with the example are higher than those of claim 10. However, Nikitina et al also teaches a broad range of corundum crystal sizes from 5 to 350 μm (see Abstract). It would have been obvious to one of ordinary skill in the art, through ordinary experimentation and optimization, to arrive at a material with the composition taught in the example and the smaller crystal sizes taught elsewhere in the document.

Rejection of Amended Claim

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nikitina et al (US 4906255).

Regarding **claim 11**, as discussed above, Nikitina et al teaches an example whose compositions anticipate those of the instant application. The crystal sizes given with the example are higher than those of claim 11. However, Nikitina et al also teaches a broad range of corundum crystal sizes from 5 to 90 μm (see column 4, lines 44-50). It would have been obvious to one of ordinary skill in the art, through routine experimentation and optimization, to arrive at a material with the composition taught in the example and the smaller crystal sizes taught elsewhere in the document, if these crystal sizes were desired for certain applications.

Rejection of New Claims

8. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being patentable over Nikitina et al (US 4936255).

Regarding **claim 23**, Nikitina et al does not teach grains having the grit number stated in the claim. However, Nikitina clearly teaches that the size of the grains can be varied by adjusting the cooling rate (see column 4, lines 44-50). Additionally, it is well known in the art that the size distribution of abrasive grains can be adjusted by sieving. This adjustment is done in order to optimize the abrasive grains for a desired function. Thus, it would have been obvious to one of ordinary skill in the art to adjust the grains taught by Nikitina to a desired level using known techniques, even though specific grain size distributions are not taught by Nikitina. This desired level could have included the

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grit number F60 of the FEPA standard cited, because this standard was known in the art at the time the invention was filed. Therefore, the creation of grains according to the teachings of Nikitina in order to meet the grain size standards of F60 would have been an obvious modification to one of ordinary skill in the art. Accordingly, the new claim 23 is not patentably distinct over the prior art of record.

Regarding **claim 24**, Nikitina et al does not teach grains having the grit number stated in the claim. However, as discussed above, Nikitina clearly teaches that the size of the grains can be varied by adjusting the cooling rate. Thus, it would have been obvious to one of ordinary skill in the art to adjust the grains taught by Nikitina to a desired level using known techniques, even though specific grain size distributions are not taught by Nikitina. This desired level could have included the grit number F636 of the FEPA standard cited, because this standard was known in the art at the time the invention was filed. Therefore, the creation of grains according to the teachings of Nikitina in order to meet the grain size standards of F36 would have been an obvious modification to one of ordinary skill in the art. Accordingly, the new claim 24 is not patentably distinct over the prior art of record.

Regarding **claim 25**, as discussed above and in the previous office action, Nikitina et al teaches fused ceramic grains that meet the compositional limitations of the claim. Nikitina further teaches that, depending on cooling rate, the corundum crystals can be made to have crystal sizes of from 5 to 90 μm (see column 4, lines 44-50). It is therefore clear that, depending on the intended application and desires of one making the grains, the teachings of Nikitina could be used to produce grains containing

corundum crystals wherein 90% have a size of less than 27 μm . Thus, creation of grains with this characteristic would be a matter of routine optimization of the grains taught by Nikitina. Claim 25 is therefore obvious and patentably indistinct over the prior art of record.

Conclusion

9. All the pending claims are rejected.
10. Applicant's arguments are not persuasive, and the new claims are rejected under previously used and combined prior art. Therefore, **THIS ACTION IS MADE FINAL.**
11. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NOAH S. WIESE whose telephone number is (571)270-3596. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry A Lorengo/
Supervisory Patent Examiner, Art Unit 1793

Noah Wiese
March 13th, 2008
AU 1793